

## REMARKS

The Final Office Action mailed March 16, 2010 considered and rejected claims 18–26. Claims 18–26 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Claims 18–26 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 18–26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Jasper et al., U.S. Patent No. 5,241,544 (filed Nov. 1, 1991) (hereinafter Jasper), in view of Matsumoto et al., U.S. Patent No. 5,912,931 (filed Aug. 1, 1996) (hereinafter Matsumoto) in view of Baker et al., U.S. Patent No. 5,067,139 (filed Dec. 17, 1990) (hereinafter Baker).<sup>1</sup>

By this response, claims 18–19 and 21–26 are amended. Claims 18–26 remain pending. Claims 18, 21, 23, and 25 are independent claims which remain at issue. Support for the amendments may be found, *inter alia*, within Specification Figures 4A and 4B, ¶¶ 0238–0239, and (amended) Table 5.<sup>2</sup>

The independent claims have been amended to clarify that each slot includes known pilot symbols.<sup>3</sup> The feature of the known pilot symbols has been limited by reciting “the known pilot symbol portion and the sync word portion in each slot being aligned consecutively.”<sup>4</sup>

Each dependent claim (except claim 20) has been amended to incorporate the feature “wherein said known pilot symbols of each slot comprise multiple known pilot symbol portions

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<sup>1</sup> Applicant reserves the right to challenge the prior art status of any cited art at any appropriate time, should the need arise. Accordingly, any arguments and amendments made herein should not be construed as acquiescing to any prior art status of the cited art.

<sup>2</sup> It should be noted that the claims as recited take support from the entire Specification. As such, no particular part of the Specification should be considered separately from the entirety of the Specification.

<sup>3</sup> As illustrated in Fig’s 4A and 4B, there are multiple slots in a radio frame (row (c)). As will be understood from rows (c) to (l) in Fig’s 4A and 4B, rows (d) to (l) show structures of each slot that varies depending on the type of channel and the symbol rate. Each slot of each channel includes pilot symbols (rows (d) to (l) except row (e)).

<sup>4</sup> This is supported by Figures 4A and 4B, amended Table 5, and ¶¶ 0238–0239 in the Specification. There is a single consecutive sequence (block) of 4 or 8 pilot symbols in each slot (rows (d) to (l) except row (e) of Figures 4A and 4B). Each sequence of pilot symbols in each slot corresponds to one pilot symbol pattern in amended Table 5 that depends on the type of channel. In amended Table 5, halftone (hatched) portions correspond to sync word portions and the other (white) portions correspond to pilot symbol portions. See ¶ 0238. In view of Figs 4A and 4B that show each slot including a single consecutive sequence of the pilot symbols, amended Table 5 represents that the sync word portions and the pilot symbol portions in each slot are aligned consecutively. For example, in dedicated physical channels at 256, 512, or 1024 kbps, which correspond to rows (g) to (i) in Figure 4B, the sync word portions (columns 1, 3, 5, and 7 in Table 5) and the pilot symbol portions (columns 0, 2, 4, and 6 in Table 5) are aligned consecutively and no other portion is inserted.

and multiple sync word portions aligned consecutively.”<sup>5</sup> In each amended dependent claim, “said known pilot symbol portions and said sync word portions are transmitted alternately in each slot.”<sup>6</sup>

### **Amendments to the Specification:**

The Specification is being amended to replace Table 5 with the corresponding Table 5 from the originally-filed parent application, Application Ser. No. 09/403,161, of this divisional application. Table 5 as included on page 31 of the Specification (between ¶ 00244 and ¶ 00245) inadvertently omitted the halftone shading (i.e., hatching) of the columns as was indicated in the original Table 5 which was included on p. 39 of the parent application. *See* Application Ser. No. 09/403,161 (filed Jan. 31, 2000). This amendment simply replaces the Table 5 in this application with the corresponding original Table 5 from the parent application which includes the inadvertently omitted halftone shading. This should not be considered as introducing any new matter as the present application is a divisional application of Application Ser. No. 09/403,161, Application Ser. No. 09/403,161 was incorporated in its entirety by reference into this Specification; *see* Specification ¶ 0001; and the present Specification already incorporates and refers to the halftone shading of the columns;<sup>7</sup> *see* Specification ¶ 0238.<sup>8</sup>

### **Claim Rejections Under 35 U.S.C. § 112:**

Claims 18–26 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.<sup>9</sup> In particular, the Office noted that claims 18, 21, 23, and 25 recited the term “block” but asserted that the Specification provided insufficient support for the particular use of the term.<sup>10</sup> Claims 19, 20, 22, 24, and 26 were rejected as being

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<sup>5</sup> This is supported by amended Table 5 and Fig’s 4A and 4B as may be understood from the explanation above. Each pilot symbol pattern of each channel (dedicated physical channel, control physical channel, or others) has at least two pilot symbol portions (white portions) and at least two sync word portions (halftone portions) aligned consecutively.

<sup>6</sup> This feature is supported by amended Table 5 and Fig’s 4A and 4B as may be understood from the explanation above.

<sup>7</sup> “Pilot symbol patterns are shown in Table 5, in which *halftone* portions represent sync words (SW) for the frame alignment.” Specification ¶ 0238 (emphasis added).

<sup>8</sup> This is in accordance with the telephone conversation between Examiner Christopher P. Grey and Thomas M. Bonacci (reg. no. 63,368) on May 19, 2010.

<sup>9</sup> Office Communication p. 2 (paper no. 20100304, Mar. 16, 2010).

<sup>10</sup> Office Comm. p. 2.

dependent upon these claims. The claims have now been amended to remove the use of the term "block" and the Applicants submit that each of the claims as now presented complies with the written description requirement. Accordingly, the Applicants respectfully request the rejections of claims 18–26 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement now be withdrawn.

Claims 18–26 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention.<sup>11</sup> The claims were rejected based on an insufficient antecedent basis for the terms "said pilot symbols" and "known pilot symbols."<sup>12</sup> Each of the claims, as appropriate, has now been amended to ensure proper and consistent antecedent basis for the recited terms. Accordingly, the Applicants respectfully request the rejections of claims 18–26 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention now be withdrawn.

#### **Claim Rejections Under 35 U.S.C. § 103:**

Claims 18–26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Jasper, in view of Matsumoto, and in view of Baker.<sup>13</sup> Claims 18–19 and 21–26 have now been amended and the Applicants submit that the cited references fail to teach or suggest all the limitations of the claims as now presented.

Independent claims 18, 21, 23, and 25, as presented for reconsideration, recite that known pilot symbols of each slot consist of a known pilot symbol portion and a sync word portion for frame alignment, and the known pilot symbol portion and the sync word portion in each slot are aligned consecutively.

The Examiner asserted that Jasper discloses that a block consists of a plurality of known pilot symbols and that the block consists of a known pilot symbol portion and a sync word portion for frame alignment. On the contrary, Jasper only discloses sync symbols 202 at the beginning of the time slot and pilot symbols 203 inserted at selected intervals (*see* Jasper column 3, lines 48–59, and Figure 2). As shown in Figure 2 of Jasper, data symbols 201 are inserted

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<sup>11</sup> Office Comm. p. 3.

<sup>12</sup> Office Comm. p. 3.

<sup>13</sup> Office Comm. p. 3 *et seq.*

between the sync symbols 202 and pilot symbol 203 and between neighboring pilot symbols 203. That is, the sync symbols and the pilot symbols in Jasper are not consecutively aligned.

In contrast, as recited in the independent claims of the present application, the known pilot symbol portion and the sync word portion are aligned consecutively in each slot. This feature is neither disclosed nor suggested in Jasper or the other cited references.

The differential feature achieves beneficial effects as follows: Transmitting the known pilot symbol portion and the sync word portion consecutively enables an increase in the data transmission efficiency and prevents an increase in overhead of the coherent detection in comparison with transmitting them separately. Furthermore, since the sync word portion is employed for the coherent detection in addition to the pilot symbol portion after establishing the frame alignment which was achieved by the sync word portion, there is no need to distinguish between the pilot symbol portion and the sync word portion in order to carry out coherent detection, and thus, the overhead for coherent detection can be reduced.

As discussed above, independent claims 18, 21, 23, and 25 are not obvious from the references cited, and thus, are patentable. For the same reasons, dependent claim 20 is patentable.

Moreover, amended dependent claims 19, 22, 24, and 26 state that said known pilot symbols of each slot comprise multiple known pilot symbol portions and multiple sync word portions aligned consecutively, and said known pilot symbol portions and said sync word portions are transmitted alternately in each slot.

These features of the dependent claims are neither disclosed nor suggested in Jasper or the other references cited. Jasper only discloses sync symbols 202 at the beginning of the time slot and pilot symbols 203 inserted at selected intervals, as stated above in conjunction with the independent claims.

These features of the dependent claims achieve beneficial effects as follows: In general, a transmitted symbol is affected by intersymbol interference from neighboring symbols which disturbs demodulation of the transmitted symbol. Since the known pilot symbol portions and the sync word portions are aligned consecutively and transmitted alternately, the sync word portion is located between the known pilot symbol portions and is also affected by intersymbol interference from the neighboring known pilot symbol portions. However, the intersymbol interference on the sync word portion can be easily removed by calculation because the

intersymbol interference from known symbols (i.e., the known pilot symbol portions) can be calculated easily, and thus, a success rate of demodulation of the sync word portion can be improved.

Therefore, as discussed above, dependent claims 19, 22, 24, and 26 are not obvious from the references cited, and thus, are patentable.

In consideration of the distinctions noted and discussed, *inter alia*, the Applicants submit that rejections of claims 18–26 under 35 U.S.C. § 103(a) as being unpatentable over Jasper, in view of Matsumoto, and in view of Baker would be improper and should be withdrawn. Accordingly, the Applicants respectfully request favorable reconsideration of claims 18–26 as now presented.

In view of the foregoing, the Applicants respectfully submit that any other rejections to the claims are now moot and do not, therefore, need to be addressed individually at this time. It will be appreciated, however, that this should not be construed as the Applicants acquiescing to any of the purported teachings or assertions made in the last action regarding the cited art or the pending application, including any official notice. Instead, the Applicants reserve the right to challenge any of the purported teachings or assertions made in the last action at any appropriate time in the future, should the need arise. Furthermore, to the extent that the Examiner has relied on any Official Notice, explicitly or implicitly, the Applicants specifically request that the Examiner provide references supporting the teachings officially noticed, as well as the required motivation or suggestion to combine the relied upon notice with the other art of record.

In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney at (801) 533-9800.

The Commissioner is hereby authorized to charge payment of any of the following fees that may be applicable to this communication, or credit any overpayment, to Deposit Account No. 23-3178: (1) any filing fees required under 37 CFR § 1.16; and/or (2) any patent application and reexamination processing fees under 37 CFR § 1.17; and/or (3) any post issuance fees under

37 CFR § 1.20. In addition, if any additional extension of time is required, which has not otherwise been requested, please consider this a petition therefore and charge any additional fees that may be required to Deposit Account No. 23-3178.

Dated this 16<sup>th</sup> day of June, 2010.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Tom M. Bonacci", with a stylized flourish at the end.

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